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ABSTRACT

Western enterprises confront an era of global competition in which industry leaders can no longer overlook negative effects originating from past Taylorist and autocratic organizational structures. Corporate leaders are exploring innovative methods to change their organizations from the Taylorist model to workplace environments that foster worker participation, decision-making, teamwork, and learning. Taylor's scientific management theory uses scientific observation to analyze human movement and restructure the workplace so that the minimum effort produces the maximum production. Organizations have attempted to improve their efficiency through humanist motivational models (Mayo, Hertzberg, Rumberger) and have sought ways to adapt the successful Japanese ideologies into Western culture. They are exploring ways to restructure and strengthen their enterprises by implementing the following Japanese models: operator responsibility for quality, continuous improvement, quality circles, statistical process control, design for manufacture, set-up time reductions, just-in-time production, total quality control, cellular manufacture, and kanban materials control. The adaptation of concepts from Japanese culture has initiated a more horizontal organizational structure--a managerial structure that requires holistic systems thinking, continuous learning and improvement, shared knowledge and purpose, employee and work team autonomy over their jobs, and collective participation in decision making. (Contains 29 references.) (YLB)

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Organizational Change from Scientific Management to the Learning Organization — Implications for New Work Systems

by

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Abstract

Contemporary Western enterprises confront a new era of global competition in which industry leaders can no longer overlook negative effects originating from traditional Taylorist and autocratic organizational structures of the past. Indeed, corporate leaders are exploring innovative methods in order to change their organizations' from the Taylorist model to examples exhibiting workplace environments that foster worker participation, decision-making, teamwork, and learning. This paper will examine these changes in the industrial workplace.

In particular, this paper will utilize metaphor to review changes enterprises have face from the bureaucratic organization to the Japanese philosophy and the learning organization. Indeed, this paper will explicate formal and informal learning, the concept of the learning organization, and how the learning organization relates to the enterprise with implications for industry-education partnerships.

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Introduction

As enterprises confront a new era of global competition, industry leaders can no longer overlook negative effects originating from traditional Taylorist and autocratic organizational structures of the past. Indeed, corporate leaders are exploring innovative methods in order to change their organizations' from the Tayloristic model with its excessive rigidity and detailed division of labor to a less hierarchical and more horizontal structure that fosters worker participation and decision-making, teamwork, and learning (Rubenson & Schütze, 1994; Cappelli & Rogovsky, 1994; Globerman, 1991; Levin & Rumberger, 1989).

The workplace environment is rapidly changing in this post-industrial era. Enterprises are restructuring today's 'post-taylorist' organization through the implementation of concepts such as decentralization, multiplication of profit centers, lean production and lean management, team work and total quality control. To execute these changes in the workplace environment, industry leaders are changing management practices to support an organizational culture of the formal and informal learning processes intrinsic to the learning organization metaphor (Marsick & Watkins, 1990, 1996; OECD, 1994; Senge, 1990; Marsick 1987; Centre for Educational Research and Innovation, 1986; Argyris & Schön, 1978).

This paper will utilize hermeneutic investigation of literature to illuminate organizational change from bureaucratic and autocratic organization to humanist models that elucidate the significance of the learning organization metaphor to the new work systems. Hermeneutics is the study and theory of interpretation. Although hermeneutics includes all understanding of speech, this paper will emphasize the textual interpretation and understanding that dominates hermeneutics (Gallagher, 1992; Burrell and Morgan, 1979). Through this investigation of literature, this paper will focus on relevant philosophical ideologies to ascertain organizational changes in the work place, Japanese influences on the new organizational structure, and implications of the learning organization metaphor upon the new work systems.

The Bureaucratic Organization

The traditional organization of the past was laden with bureaucratic structure. Max Weber, a German philosopher, depicted a lucid description of the bureaucratic organization. His early studies in law combined with his lifelong research in sociology of world religions and sociology of economic life enhanced his perspective and study of organizations and the legitimacy of authority and power. Weber identified three types of legitimate authority: rational grounds or legal authority, traditional grounds or traditional authority, and charismatic grounds or charismatic authority. These three types of legitimate authority constitute bureaucratic authority in government and bureaucratic management in private economic enterprises (Pugh & Hickson, 1989; Weber, 1946, 1947).

The enterprise gives rational grounds or legal authority to the persons in power through normative or written rules. Subordinates will respect their leaders' authority only as long as leaders are within the legal framework of the organization's written and unwritten rules. In this type of bureaucracy, administrators must demonstrate technical competency and/or training qualifying them for the appointment to a position. It is this sphere of competence that provides a division of management and labor (Weber, 1947).

Although Weber's philosophy usually emphasizes the use of a the legal framework of rules in the bureaucratic organization, Weber espouses that traditional grounds or traditional authority relies on established beliefs and traditions. Indeed, individuals may receive positions through family and connections without recognizing the competency requirements of rational grounds. Subordinates may follow these appointees due to tradition. Alike traditional authority that does not follow the rational grounds, individuals achieve charismatic grounds or charismatic authority through their character. This may be due to prestigious recognition, exemplary character, or specific talents needed by the organization (Weber, 1947).

Scientific Management

Frederick Taylor was an engineer who began his career as a laborer in a steel foundry. From this milieu he advanced to the position of a foundry supervisor and later an industrial consultant. During his lifetime (1856-1917) he developed and promoted his scientific management theory (Pugh & Hickson, 1989) in which Henry Ford and most of Western industry implemented at a time of heavy industrialization and expansion from an evolution in manufacturing technologies. Taylor's scientific management theory uses scientific observation to analyze human movement and subsequently restructures the workplace in such a way that the minimum effort produces the maximum production. As a result of scientific management, productivity increased in the factories and general workplace and human beings entered a realm of mechanized work in which they labored with repetitive motion as if they were machines. This dehumanization of the worker initiated the 'machine metaphor' (Morgan, 1986).

Taylor advocated five principles of scientific management: shifting all responsibility for the organization of work from the worker to the manager, using scientific methods to determine the most efficient way of doing work, selecting the best person for the position as the job is defined, train the worker to work efficiently, and monitor worker performance to ensure that workers follow the appropriate work procedures (Morgan 1986).

The machine metaphor not only required wage earners to work in a mechanistic fashion, it also left all the thinking to managers and all the doing to workers. Indeed, Taylor promoted this concept and "was fond of telling his workers, 'you are not supposed to think. There are other people paid for thinking around here'" (Morgan, 1986, p. 32). It was this philosophy of leaving your brains at the door, in addition to the dehumanization of repetitive mechanistic tasks that earned Taylor the reputation of the enemy of the wage worker (Morgan, 1986).

As organizational theorists since the emergence of scientific management have compared theories to the machine metaphor, Taylor compared his scientific management theory to medieval

management methodologies previously in place, whereas, a company with five hundred to a thousand workers with a representation of perhaps fifteen trades was using a one-on-one apprenticeship training methodology in order to train its workforce (Taylor, 1916).

The United States in early twentieth century had a growing immigrant population and a workforce with low education and multiple languages that inhibited communication. In this low skilled workforce, Taylor's scientific management enabled wage earners to obtain employment and enabled industry to grow. To his credit Taylor believed he was helping the worker and the workforce (Morgan, 1986). In his testimony to the House of Representatives Committee in 1912, Taylor expounded on the virtues of scientific management to both the employers and employees. During his testimony Taylor embraced the new methodology in his statement, "[t]he new way is to teach and help your men as you would a brother; try to teach him the best way and show him the easiest way to do his work. This is a new mental attitude of the management toward the men, and the reason I have taken so much of your time..." (Taylor, 1947, p. 139). As Pugh and Hickson (1989) later pointed out, organizations did not understand or adhere to all of Taylor's principles, for few employers were willing to remove wage ceilings and pay high-producing workers their actual worth. Taylor sought a mental revolution in which both sides would share in the surplus earnings and shift their efforts toward increasing the surplus (Taylor, 1947).

As the literature indicates, Taylor felt he was an advocate of both the employer and employee as he moved organizational management beyond the medieval practices of the past. His theory amplified a division of labor and the dehumanization of the machine metaphor, subsequently making him the adversary of unions and wage workers. As Morgan points out, from an intense narrow focus on his philosophy Taylor places himself into the psychic prison metaphor which inhibits his ability to view scientific management from different perspectives (Morgan, 1986).

Humanist Perspectives

Elton Mayo and other social scientists experimented with industrial human relations at Western Electric Company's Hawthorne Works for five years from 1927 to 1932. As a result of this study and his investigations in a spinning mill in Philadelphia, Mayo illuminated the work environment and the social effect groups have upon individuals (Mayo, 1949; Pugh & Hickson, 1989). Indeed, Mayo espoused that the working group set latent standards in the volume of production and what constituted a day's work. Through these standards, this work group motivated the individual workers (1949).

These experiments involved adding lighting to work areas, reducing the length of the day, and adding short break periods. This new internal environment led to employee motivation and higher production. Furthermore, Mayo's experiments grouped workers into teams and gave a test group autonomy over their work. This resulted in a motivational effect not only for the test group, but also for externalities of the teams that emulated the test group on their own initiative. Interviews with the employees amazed Mayo with an overwhelming response of statements indicating that the changes were the best thing the company had ever done. Through these experiments, Mayo learned that empowering groups of workers with group control over their task had a significant influence on employee attitudes and motivation. This contradicted Taylor's philosophy of scientific management by imbedding human relations and industrial sociology. From his findings, Mayo also described human resource changes and methods managers could use to create a humanistic environment in the workplace (Mayo, 1949).

Stemming from the 1959 Hertzberg, Mauser, and Snyderman study of two hundred interviews of engineers and accountants in the Pittsburgh area on job satisfaction, Frederick Hertzberg developed his motivation-hygiene theory (Hertzberg, 1966). Hertzberg's theory receives recognition as a classical theory in motivation and supports the humanist approach for change in the Taylorist organization. Indeed, Hertzberg's 1968 article "One more time: How do you motivate employees?" has again appeared in a 1990 Harvard Business Review.

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Hertzberg illustrates a concept of employee motivation which he calls "kick in the pants" (KITA). Negative KITA are those ways in which managers motivate employees through the use of negative motivators, such as inflicting psychological pain. Hertzberg found that, while easy and tempting for managers to administer, negative KITA defeats its purpose by leading to movement, not motivation. Managers perceive positive KITA as those types of motivators used as the "carrot" instead of the "stick," such as fringe benefits, sensitivity training, and job participation. These motivators achieve the same ends as negative KITA; they result in movement, not motivation, and have little lasting impact on long term productivity improvement (Hertzberg, 1990).

Factors that produce job satisfaction are separate from those leading to job dissatisfaction and managers should pay attention to their distinctions. Hertzberg identified five motivational factors that enhance job satisfaction, including achievement, recognition, work performed, responsibility, and advancement. He found that factors leading to job dissatisfaction (or "hygiene") included those that are extrinsic to the job, such as company policy and administration, supervision, salary, interpersonal relations and present working conditions (Hertzberg, 1966, 1990). Hertzberg provides managers with a detailed comparison between what he calls hygiene seekers and motivation seekers and methodologies for theory-in-practice that managers can utilize to enhance the workplace environment through positive and continual motivation (Hertzberg, 1966).

Indeed, Hertzberg's motivation-hygiene theory identifies humanistic aspirations for change from mechanistic scientific management to a more co-operative organization that provides achievement, recognition, and responsibility.

Rumberger (1981) studied the effects on individuals who were unable to use their education in the workplace. He defined this non-use of the workers' education in the workplace as over-education. This study identified the possible effects of over-education, such as job dissatisfaction,

deterioration of mental and physical health, turnover, absenteeism, strike activity, drug problems, industrial sabotage and ultimately lower productivity. Rumberger found that over-education was widespread in the workforce. From his findings, he argued that as long as employers charged workers with mechanistic jobs and individuals work below their ability, the negative effects of over-education would continue.

Abraham Maslow (1970) found that the desire to fulfill human needs is in effect the primary motivational factor upon the individual. He identified human needs as a hierarchical taxonomy transcending from physiological to safety, social, esteem, and self actualization. In Taylor's model, workers meet their needs of physiological and safety through wages and security, however this model leaves their higher needs unfulfilled. These unfilled needs can leave the wage earner ungratified, as Mayo and Hertzberg found in their studies, or disgruntled, as Rumberger discovered. Hence, Mayo, Hertzberg and Rumberger's studies uncovered the organization and management structure and methodology that led the evolution toward the new work system and learning organization.

Japanese Organizations

Another major impact on new work systems was the success of the Japanese organizational design. To examine the Japanese model, one must look at the Japanese culture. Gareth Morgan (1986) used the cultural lens to illuminate the development of the Japanese organization.

> Rice farmers in Japan have always been willing to share their crop with those who are able to look after them. Such was the case in relation to the samurai, the 'men of service' who depended on the farmers for their rice and physical existence. They played an important role in Japanese military and bureaucratic history and are now paralleled in the managerial 'clans' or elites that run Japanese society (pp. 115-116).

This aspect of the Japanese culture is evident by the quality circles in which workers demonstrate a willingness to contribute extra hours by arriving at work early or staying at work late in order to identify methods that improve workplace efficiency (Morgan, 1986).

In Japanese society of *shakai*, which emerged from historical *samurai* culture, individual workers abide by a role that is secondary to the organization. *Shakai* embellishes the societal concept in that it possesses a strong collective connotation and provides a democratic emphasis with the Marxist values of public interest, or the whole community over individualism. There is an assumption in the traditional Japanese culture that charges each person with the duty to contribute their maximum to the organizational goal (Whitehill & Takezawa, 1968). This cultural perspective of the public interest contradicts the American culture of individualism (Nonaka & Takeuchi, 1995; Whitehill & Takezawa, 1968.).

In the Japanese organization management decisions are made through *ringi*, which is a written request passed around to each manager for consensus or adaptation before the originator submits it to top management for approval (Whitehill & Takezawa, 1968; Oliver & Wilkinson, 1992). *Ringi* illuminates the cybernetic model, in which managers eliminate potential opposition and negative feedback to their proposals (Morgan, 1986). In Japanese labor and management negotiations, worker union representatives discuss and negotiate over management decisions on an ad hoc basis rather than the formal negotiated contracts used in the United States and Canada (Whitehill & Takezawa, 1968).

Japanese manufacturing organizations have developed characteristics such as lean or high production. These high production methodologies include statistical process control (SPC), just-in-time (JIT) inventory control systems, continuous improvement, and total quality control (Cappelli & Rogovsky, 1994).

J. M. Juran imported total quality control, or company-wide quality control, to Japan. After the introduction to total quality control, Americans Juran, Demming, and Feigenbaum promoted the company-wide quality control philosophy to Japanese industry during the late 1950s. Western companies ignored the total quality control model until Japanese industry gained recognition for competitiveness in the global market. Where Western industry utilizes quality

inspectors at the end of an assembly line, Japanese companies give each worker the responsibility for the quality of their work. This includes the quality of the products and the power to recommend product improvements from the floor worker to the design engineer. In addition to every worker empowered over quality, many Japanese corporations utilize small groups of workers called quality-circles. Participants in quality-circles receive intensive training in statistical process and control; it is these groups that ensure the quality on the shop floor during production. These methods of worker empowerment directly contradict Taylor's scientific management where managers do all the thinking and workers have no mental input for their work (Oliver & Wilkinson, 1992).

Japanese workers use statistical processes control (SPC) to chart the product of their labor to improve their performance and improve the end product. Indeed, from a cultural perspective the Japanese organization uses a philosophy called *kaisen*, which is a belief stemming from Zen Buddhism in that as one can never be perfect, one must continually work toward improvement. The Japanese organization recognizes the impossibility of reaching actual perfection and continually strives, through *kaisen*, to improve the process and end products. In contrast to the Japanese philosophy of continuously working for improvement, Western culture has evolved around establishing fixed goals and striving to meet them. However, Western cultural perception places a synonymous relationship between perfection achievement and the attainment of fixed goals (Nonaka & Takeuchi, 1995; Oliver & Wilkinson, 1992).

Just-in-time (JIT) production is a holistic approach vis-à-vis inventory and the manufacturing process. Utilizing JIT production systems, Japanese manufacturers organize the complete inventory process with the production process to eliminate surplus inventories. Hence, all parts arrive and sub-assemblies are produced just in time to arrive on the floor at the proper time for assembly. Similar to JIT, Japanese companies utilize *kanban*. *Kanban* is a shop floor inventory system that uses specially designed containers to hold a precise quantity of individual components. The *kanban* container has cards (or more recently electronic recording) to signify

the stock in the container. This allows the company to eliminate waste in storage, labor, and financial investment in large inventories (Oliver & Wilkinson, 1992).

Utilizing cellular manufacture, a methodology of the former Soviet Union, Japanese manufacturers group machines that produce related components together, in order to enhance work organization. Oliver and Wilkinson (1992) provide an example of this methodology in the Toyota production system where the company arranged machines in a "U" design with workers in the middle. This system gives each worker access to three or four machines rather than one machine as on the American Ford style assembly line. As an analogy, a worker mounts a raw composite for assembly and the machine takes two minutes to complete all the functions; during which time the worker installs the last produced component on the next machine in order for the machine to bond on the next part. Therefore, each worker can work from one machine to the next as required by the task, rather than waiting for one machine to perform its operation.

Another interesting Japanese methodology based on JIT is the set-up time for manufacture, which American manufacturers have accepted as a standard of production. Oliver and Wilkinson found that after Toyota organized their machines in *kanban* and implemented strategies such as intensive worker training, machine standardization, and the development of special tools, the change over in one stamping shop reduced from ten hours to 165 seconds. To further reduce the set-up time required for manufacturing the different components, Japanese companies have designed parts that are interchangeable and used in several areas of the finished product (1992).

Japanese companies have implemented a design for a manufacture program, enabling ease of manufacture through JIT, *kanban* and set-up time. In this model a design leader assembles a team from throughout the production plant in order to design quality products for ease of manufacture (Oliver & Wilkinson, 1992). Indeed, this provides a holistic approach, which not only increases the efficiency of the manufacturing process, but also humanistic motivation as the floor worker has influence over new innovation and methods.

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Many of the Japanese methodologies of statistical process control, just-in-time (JIT) inventory systems, continuous improvement, and total quality management have been successful in Western corporations. Oliver and Wilkinsons' review of three case studies in Britain manufacturing plants (Nissan Motor Manufacturing, Komatsu, and K-Electric) found that people resisted change at first. However, once the workers adjusted to the management changes and personnel practices, they enjoyed the new work system. The results of these changes to a new work system included low absenteeism and turnover, and increased production and profits (1992).

The Japanese companies in the UK studied by Oliver and Wilkenson did not use all the Japanese methodologies. However, Oliver and Wilkenson did find astounding results in a larger study of 52 Japanese companies in the UK in 1991. Table 1 shows the occurrence of implementation of the Japanese practices while Table 2 shows the efficiency of these practices.

Table 1

Manufacturing practices by Japanese companies in the UK.

Practice	Never used %	In use %	Planned or being Implemented
Operator responsibility for quality	4	80	16
Continuous improvement	6	65	29
Quality Circles	12	62	26
SPC	21	54	25
Design for manufacture	40	54	6
Set-up time reductions	30	50	20
JIT production	27	46	27
Total quality control	10	39	51
Cellular manufacture	60	33	7
Kanban materials control	55	30	15
n = 52			

Source: Oliver and Wilkinson, 1992, p. 252.

As Table 1 indicates, not all of the Japanese companies in Britain planned or implemented all the Japanese ideologies. However, most of the enterprises in the study had implemented or were planning to execute measures (such as giving autonomy over decision making to individual operators) that run contradictory to the traditional Tayloristic British firm.

Table 2

Evaluation of manufacturing practices by Japanese companies in the UK.

Practice	Not successful %	Quite-very successful %	Highly successful %	Mean
Operator responsibility for quality	5	74	21	2.81
Continuous improvement	3	78	19	2.83
Quality Circles	9	79	12	2.50
SPC	3	87	10	2.39
Design for manufacture	5	80	15	2.50
Set-up time reductions	4	96	-	2.39
JIT production	14	75	11	2.39
Total quality control	4	85	11	2.53
Cellular manufacture	6	82	12	2.56
Kanban materials control	13	74	13	2.33
n = 52				

Source: Oliver and Wilkinson, 1992, p. 254. (Order rearranged to match Table 1)

Oliver and Wilkinson discovered that British workers and unions at first objected to the Japanese philosophy. After the implementation of these new methodologies, most British workers in these organizations found that they preferred the empowerment over their jobs and the camaraderie of working in teams rather than isolationism from the machine metaphor of scientific management. As shown in table two, the methods stemming from Japanese models were predominately successful. However, Oliver and Wilkinson also found that there was some deterioration in the effects of these ideologies in their 1991 study from their previous 1987 study. They contributed this deterioration to strict personnel practices, such as prohibited smoking and

eating on the shop floor, meticulous enforcement of work standards and quality control, and "bell-to-bell" working in which workers could not take toilet breaks between scheduled work breaks (1992).

As Oliver and Wilkinson found, implementation of Japanese methodologies requires modification in order to address the cultural differences between the *samurai* philosophies in Japan and Western individualism perspectives. These differences are evident in the Japanese tradition of living harmoniously in society and the culture emphasis on the 'whole personality.' This contradicts Western cultural perception of knowledge as being separate from human philosophical and epistemological development (Nonaka & Takeuchi, 1995).

In sum, the emergence of the successful Japanese organization originated from the development and adaptation of new concepts within the Japanese culture. Although many of these concepts originated in the West, it was the Japanese companies that utilized them successfully and moved away from the Tayloristic structure. As Western companies strive to improve their global competitiveness and market share, they are studying the Japanese model to determine strategies to restructure and improve their organizations.

The Learning Organization Metaphor

These new Western strategies are changing the structure of the workplace from the bureaucracy illuminated by Weber and the machine metaphor of Taylor's scientific management to the new work system. This new work system posits a horizontal rather than vertical organizational structure. In this new horizontal structure workers receive autonomy and utilize many of the Japanese philosophical ideologies. However, these changes are not spontaneous and require continual learning to overcome obstacles created by traditional practices of the past. Where employees previously received directions not to think, now they learn to make decisions and participate in the growth of the organization. Thus, the individual and organization as a

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whole now strive toward continuous learning, initiating the emergence of the learning organization metaphor in this new work system.

Marsick & Watkins define the learning organization as an organization that draws from the collective intellect and continually learns and grows. Individuals learning in an organization do not necessarily constitute a learning organization; a learning organization must involve aggregated learning. Therefore, the learning organization must advocate learning through teams and groups that provide individuals opportunities to share lessons and work together to mutually gain new knowledge (1996).

Although organizational learning can not occur without individual learning, the learning organization metaphor relates to an organization that develops strategies for collaborative learning and change. Argyris and Schön espouse that "[o]rganizational learning occurs when members of the organization act as learning agents for the organization, responding to changes in the internal and external environments of the organization by detecting and correcting errors in organizational theory-in-use, and embedding the results of their inquiry in private images and shared maps of organization" (1978, p. 29). Hence, learning organizations involve the participation of the workers through teamwork and the sharing of knowledge or brain-power rather than the individual isolationism predominant in the Taylorist organization.

The balance of this paper investigates the philosophy of the learning organization metaphor through cybernetics and holographic models in relation to continual learning through detection and correction..

The Cybernetic Brain

Cybernetics correlates to a behavior that is self-regulated, strives for error detection and correction, reduces negative feedback, and questions operating norms through single and double loop learning. The Japanese demonstrate the strength of the cybernetic approach to management through *ringi* decision making and management by objectives (Morgan, 1986). Morgan

postulates that in the Japanese model, the contrast between Japanese and Western organizations is as much cybernetic as cultural.

Argyris and Schön expound upon espoused theory or theory-in-action and the actual behavior theory-in-use. They assert that for learning to be effective, companies must look beyond what they say they do in theory-in-action and learn from their theory-in-use, which is often tacit. Organizational behavior responds to the internal and external environments. When companies detect and correct errors influencing their theory-in-use vis-à-vis internal and external environments they are in effect single-loop learning. Single-loop learning transpires when individuals engage in collaborative inquiry in order to ascertain causes of errors, create strategies for error correction, and evaluate the results. Single-loop learning involves environmental factors such as external competition whereas a corporation may change their theory-in-use by implementing pricing, production, or internal measures to enhance employee attitudes and efficiency. Since single-loop learning detects and corrects errors, it is present in the Taylorist organization and the new work system (1978).

Transcending single-loop learning, the learning organization utilizes double-loop learning. Double-loop learning involves learning through the inquiry and implementation of change in organizational norms (Argyris & Schön, 1978). Thus, in double-loop learning organizations may not only change their behavior of theory-in-practice, but also change their theory-in-action. Double-loop learning is the gap between what people say and do. In order to enhance its position in the marketplace, the learning organization analyzes its norms and develops strategies to change the corporate norms, structure, and internal environment.

Argyris and Schön espouse that employees in the effective learning organization and the organization as a whole continually learn from previous single-loop and double-loop learning. He refers to this ability to continually improve and apply past learning context as deutero-learning, which takes place in learning curves (1978). It is this continual improvement through the lens of the learning organization metaphor that links theory and practice for efficiency in the

new work place (Marsick & Watkins, 1987). Van Onna affirms that the challenge is to foster a work place environment that is open to learning processes (1992).

Holographic Character of the Organization

The brain's holographic character reflects the patterns of connectivity through which, each connected nerve-cell functions independent and collectively. Brain cells in this system can perform multiple tasks and when one cell becomes inactive another can continue the task without interruption. Alike the holographic brain, the work design in the new work system creates a holistic relationship between employees and their work. Workers learn the complete production process and knowledge of their products. Employees develop common values and vision through extensive education and training (Morgan, 1986). Like the Japanese model, the new work system utilizes a team approach, whereas, each individual could work in any position and the organization remains vibrant in the absence of an individual. Using the holistic knowledge and experiences of the individuals collectively enhances new organizational perspectives, as the aggregated IQ of the work team is much higher than the single individual (Bivins-Smith, 1996; Senge, 1990; Morgan, 1986).

There is a weakness in this approach, whereas, redesigning the organization to an innovative and learning organization must have change in attitudes and values (Morgan, 1986). In order to benefit fully from a structural change to the new work system, everyone from the top management to the shop floor worker must have a shift in mind and commit to continuous learning.

Conclusion

Western organizations are exploring ways to restructure and strengthen their enterprises by implementing Japanese models of operator responsibility for quality, continuous improvement, quality circles, statistical process control, design for manufacture, set-up time reductions, just-in-time production, total quality control, cellular manufacture, and *kanban*

materials control (Watkins & Marsick, 1996; Cappelli & Rogovsky, 1994; Oliver & Wilkinson, 1992; Munnelly, 1987; Morgan, 1986; and others). Munnelly found that failures of these ideologies in several corporations occurred after management implemented programs such as quality circles without involving employees. This in effect led to employee skepticism and unrest. Indeed, Munnelly's research found that American workers want to participate in restructuring their organizations and want to have a part in decision making and more autonomy over their jobs (1987).

When Taylor developed his scientific management model, the machine metaphor flourished due to the predominant lack of education in the workforce. However, today most of the American populous has some secondary or post-secondary education. Hence, Rumberger found that more educated workers are discontent when they can not utilize their abilities.

Learning for organizational efficiency must be synonymous with individual learning in the company. Organizations should not leave the responsibility of learning to the individual in isolationism from the work place (Marsick, 1987). Therefore, Western companies may consider change in order to remain competitive through new organizational paradigms, employee training, employee motivation, and horizontal management.

These ideological perspectives for the work place provide the groundwork for a major shift as companies move from Tayloristic and autocratic structures to the learning organization. These aggregated learning approaches bring the individual new personal and marketable knowledge and skills, and for the corporation global competitiveness and increased profits. However, organizational strategists developing a learning organization should be careful not to fall back on past bureaucratic and autocratic practices and should look at the organization as a whole system of intertwined parts, all interrelated and interdependent.

As identified in this hermeneutic investigation of literature, there have been dramatic organizational changes from the bureaucratic structure illuminated by Weber and autocratic

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scientific management philosophy of Taylor. Organizations have attempted to improve their efficiency through humanist motivational models and have sought ways to adapt the Japanese ideologies into Western culture. This adaptation has initiated a more horizontal organizational structure -- that of managerial culture that requires holistic systems thinking, continuous learning and improvement, shared knowledge and purpose, employee and work team autonomy over their jobs, and collective participation in decision making. These implications of the learning organization metaphor upon the new work system infer the question of whether managers will embrace these concepts and relinquish authority, and whether the political agendas of unions, management, and workers will hinder efficiency of the new paradigms.

The changes in the workplace are evident. With the growing emphasis on developing society in the workplace, there is an increasing need for community colleges and university to develop industry partnerships and provide the instructional support to transform the American workplace as it enters the global information economy of the twenty-first century.

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